

CLAIMS

1. A voice coil type linear motor with a cooling function comprising:

a closed magnetic circuit formed into the θ-shape, by an inner yoke provided between a pair of outer yokes made up of magnetic materials arranged in parallel with a longitudinal center axis in such a manner as to be in parallel with the pair of outer yokes, the outer yokes and side yokes provided at both end portions of the inner yoke; and

permanent magnets provided on inner sides of the outer yokes and on outer sides of the inner yoke with polarities thereof which face opposite surfaces of the outer yoke and the inner yoke being made opposite to each other or with polarities thereof which face only the outer yokes being made opposite each other to thereby a field, wherein

an armature made up of a bobbin of non-magnetic and insulating materials and a coil provided around the bobbin is provided between the permanent magnets via air gaps in such a manner as to move in an axial direction or in such a manner that, on the contrary, the armature is made stationary, and the permanent magnet sides move,

the coil is wound around the bobbin,

a case is constructed on an exterior of the bobbin,

a coil portion is made watertight,

a fluid supply port and a fluid discharge port are provided

on the bobbin or the case, and

a cooling fluid is caused to flow between the coil and the case so that the coil is cooled directly.

2. The voice coil type linear motor with a cooling function as set forth in Claim 1, further comprising:

an O-ring mounted between the bobbin and the case so as to realize watertightness therebetween to thereby cool the coil directly.

3. The voice coil type linear motor with a cooling function as set forth in Claim 1, wherein

watertightness is realized between the bobbin and the case by joining the bobbin and the case together through bonding or a combination of bonding and screw fastening to thereby cool the coil directly.